Course Perceptions & Approaches to Learning Using Problem-based Learning in International Economics

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Key takeaways

- What/why/how of problem-based learning
- Issues in economics education literature:
  - Deep vs surface learning approaches
  - Relevant questions are qualitative
  - Comparison is unhelpful
- Results of the study
- Recommendations for curriculum development

What is problem-based learning?

- A member of the class of self-directed learning approaches: (Roy, Kustra & Borin 2003)

Who takes responsibility for learning?

Teaching methods can be seen along a continuum. At one end, the instructor takes complete responsibility for course content and the direction of the course; at the other end, students take complete responsibility for course content and the direction of the course requires more student initiative and responsibility.

Teacher takes more responsibility — **Student takes more responsibility**

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Lecture Course | Self-Paced Course | Simulation Role Play | **Inquiry Problem-Based Learning** | True Self-Directed Learning

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What is problem-based learning?

- A member of the class of self-directed learning approaches: (Roy, Kustra & Borin 2003)
- Small groups of students direct their learning autonomously
  - Brainstorm issues in problem
  - Identify existing knowledge & gaps
  - Decide what they need to know in order to understand problem
  - Decide how to demonstrate understanding

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- Knowledge learned in the context in which it will later be used
  - Knowledge plus skills in using knowledge

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- Objectives: 60% knowledge/content, 40% process (Woods)

Why problem-based learning?
To learn information in the context it is used

"…students were disenchanted and bored with their medical education because they were saturated by the vast amounts of information they had to absorb, much of which was perceived to have little relevance to medical practice…"

(Barrows 1986)

"Studies of the clinical reasoning of students and resident physicians in neurology suggested that the conventional methods of teaching probably inhibit, if not destroy, any clinical reasoning ability (Barrows and Bennett, 1972)."

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Economics students call for shakeup of the way their subject is taught

Students from 19 countries argue economics courses failing wider society by ignoring need to address 21st-century issues

Phillip Inman, economics correspondent
The Guardian, Sunday 4 May 2014 19.42 BST

Why problem-based learning? To reliably engage students

- Siegfried & alias (1991, 215)
- Walstad & Larson (1992)
- Frank (1998, 14)

  "most students leave introductory economics never having fully grasped the essence of microeconomics"
- Walstad & Algood (1999, 350; also footnote 3)
- Norrie & alias (2009)

"Why use PBL?" (Woods 2012)

- Subject knowledge comparable to traditional
- Statistically significant improvements in motivation, retention, problem solving/team/confidence
- Statistically significant evidence of learning oriented toward understanding
- Teaches information gathering

Goals of study

- To establish the effects of problem-based learning in an economics course context:

  ARE students oriented toward understanding?

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- To establish the effects of problem-based learning in an economics course context:

  ARE students oriented toward understanding?
- **To explore how problem-based learning is experienced using an appropriate data field**
  - Lancaster: Course Perceptions Questionnaire & Approaches to Studying inventory
  - Content analysis of (graded) reflections
  - Gainen Inventory of Learning Preferences
  - Structured interviews
  - (Course grades)

PBL in Economics?

- Goodman (2010): students given steps to solve problem ("problem-based synthesis" Woods 2012)
- Mergendoller, Maxwell & Bellisimo (2005, 2006): self-paced group instruction instructor; apparently providing content when asked
- Smith and Ravitz (2008): content has primacy over facilitation skills; follows a textbook; evaluate "usefulness" of PBL using MC test
- Dan Graham (Duke): seminar course?

What is deep & surface learning?

- Contrary to popular usage, NOT categories of content/concepts
- Rather, a behaviour chosen strategically by the student

What is deep & surface learning?

- "Adopting a deep approach to learning"

  orienting learning activities around an intention to understand, connecting it to existing knowledge, using logical and/or evidence based reasoning

- "Adopting a surface approach to learning"

  seeking to retain enough of the material to pass the course; rote learning

What is deep & surface learning?

- "Adopting a deep approach to learning"

  induced by reasonable content goals, immersive activities, supported autonomy that builds confidence/risk taking

- "Adopting a surface approach to learning"

  induced by excessive content, passive learning, feelings of overwhelm & fear of failure, extrinsic goal

Deep vs Surface Learning

- Difference in how students encode & retain information
- Not fixed or inherent to student: Influenced by learning environment (Gibbs 1992)
  - Same student can take a deep approach in one course, surface approach in another
- Manifests for instructor in question:

“Are they getting it?”

$$\lim_{n \to 8} \left(\frac{1}{n-8} \right) = -\infty$$

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Deep Learning in Economics?

Appropriate instruments apparently unrepresented in published literature

- Santos & Lavin (2004): uses MC test with 8 “deep” & 8 “surface” questions “learning inputs ➔ knowledge output”
- Smith and Ravitz (2008) similarly uses MC

How is it measured in HE lit? Lancaster Approaches

- A family of survey instruments (Ramsden, Entwistle & coauthors, late 1970s/ mid1980s; Ramsden 1983) student *approach* and *intention*

Approaches to Studying Inventory:

Differentiates learning for understanding (*deep*) & rote/unintegrated (*surface*) approaches to learning

Course Perceptions Questionnaire:

Asks whether learning environment perceived as supportive learning

How is it measured?

- Lancaster instruments (Ramsden1983)
- Corroborating evidence from multiple sources
  - **Content analysis of reflections**
  - **Structured interviews**
  - Gainen Inventory of Learning Preference
  - Grades
- Ethics clearance received (UW ORE #17927).

Small-group, self directed PBL

- Econ 231: 2nd yr international "survey"
- McMaster model (Neufeld & Barrows 1974)
  - 4 x 2 week problem cycles, 2 mtgs/week (13 wks)
  - Meeting 1: Tutored groups of 6 – 8 students
  - Meeting 2: Whole group (expert information)
  - Triple jumps (Kustra 2007)
  - Writing: summaries, reflection
  - Final exam based on homework problems

Students' Ave. Approach to Learning

	Strategic	Surface	Deep	SCORE
Beginning of Class (n=50)	16.7	15.5	17.2	18
End of Class (n=53)	16.3	15.4	16.4	17
Paired Difference (n=44)	-0.5	-0.7	-1.1	-0.9
Entwistle & Ramsden 1983	12.7	13.7	14.2	13

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Barb Bloemhof - 25 June 2014

Students' Average Course Perceptions

	GT	OS	FL	CG	VR	SC	WL	FT	CPQ	CC	SC	s/c
Beginning of Class (n = 50)	7.8	7.2	6.7	8.3	7.3	5.8	6.0	7.7	30	9.4	15	2.1
End of Class (n = 53)	9.3	9.9	8.6	5.6	6.5	6.0	5.8	4.5	36	7.3	18	3.5
Paired Difference (n = 44)	1.4	2.8	1.7	-3.2	-1.2	0.1	-0.4	-3.5	5.5	-2.3	3.1	1.35

GT = good teaching; OS = openness to students; FL = freedom to learn; CG = clarity in goals
VR = vocational relevance; SC = social climate; WL = workload; FT = formal teaching methods
CPQ = total of these; CC = control-centered (10 + workload – freedom)
SC = student-centered (sum of good teaching + freedom); s/c = ratio of SC/CC

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Results:

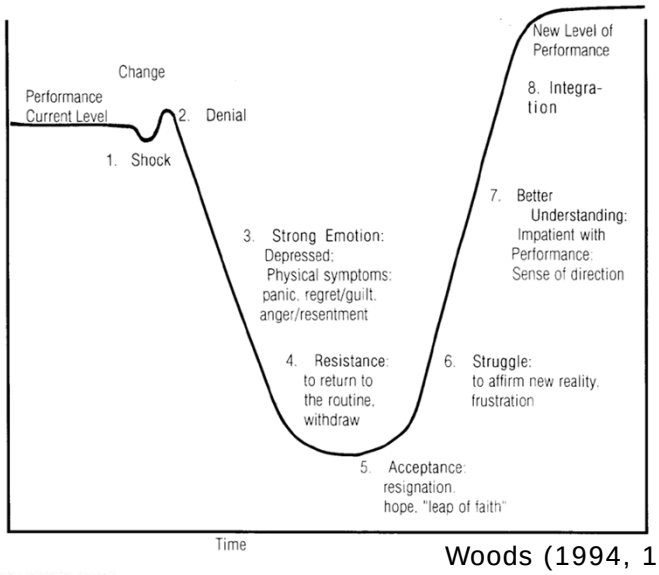
- Students exhibit an orientation towards understanding the course material (deep approach to learning)

- "In lectures the prof can speak all they want about a real life example… but that doesn't mean everyone can relate/understand. On the other hand speaking to people close to your age and sharing experiences this way will make many people understand and relate better." (27)
- This course, the learning style is so different than the classic way of lecture. Throughout highschool [sic] and university, I've been experiencing teachers/professors lecturing and at the end of the day, I would be reading the textbooks of what the teachers/professors had taught… [W]e are just retaining information and knowledge rather than learning how to expand the topic or understand the theory by developing it by ourselves… This process helps my brain/mind to engage more and learn more than what it is required." (33)

- "I find that it's worked out quite well. I mean, I'm able to recall most of the things I learned in that course and that was almost six months ago, whereas with other economics courses, especially the theoretical ones, you know, you study for two weeks, you pass the exam, and then two weeks later you forget about it." (III)
- …[I]t's not so much memorizing as thinking back to a time like "oh yeah, when I was interested in exchange rates, what did I find out?" It's really a change from going into a lecture… I mean your brain organizes the information a lot better when you form the problem yourself and you have some sort of interest in the problem before you go research it. (IV)
- "[T]he motivation behind doing the work is completely different. You're not really doing it so much for a mark per se… you're not really worried about doing well anymore… [T]here would have to be something completely wrong if you fail at doing the thing that you are interested in." (III)

Results:

- Strong emotional response that evolves; mirrors grief curve



Woods (1994, 1-1)

"After being introduced to Problem-Based Learning…, I was very nervous to see how things would work out [and] whether or not this type of learning/teaching method would help me succeed now and in the future. I definitely went through all the stages in the "Coping with Change" graph, but now, I am confident in the PBL process. Working in groups to decipher problems that occur in our world, to learn about course content is an amazing process. I'm very sure all my group members were just as nervous and confused as I was at the beginning, but as we started getting into our weekly PBL routine, it came to be very effective and helpful in enlightening us on how concepts we learned in Monday's lecture apply to real-life situations." (38)

"Every problem or question that we've gone through, whether in class or in group feels like going through the "curve" again. Even as I'm writing this reflection write [sic] now, I'm also moving along the "curve" once more. … [W]hen I reach a conclusion about the problem, whether my response is correct or not, I've reached the end of the curve and have an informed response. Regardless of the correctness, the thought process that I've gone through help [sic] me to have more confidence in my answer due to the researches [sic] along the way." (1)

Results:

- Students exhibit an awareness of gains in information literacy/process skills/confidence
  - Ability and intention to tackle any new problem

"Even though confusing at first, the greatest benefit [of relatively ambiguous research assignments] was that we were to use our own discretion in determining what matters are of the most relevance to the topic." (11)

"[T]he methods we used to determine our research paths are necessary for individuals to look objectively at the information that bombards us in our daily lives. Problem based learning has given me the tools required to effectively look at information, and to make educated choices." (47)

"I know for 100%, a lecture based style learning is what I prefer… [P]roblem based learning is a good idea, but not for economics. There are too many theories and models to learn… Maybe I need more time in the problem based learning environment… I have come to accept the idea of PBL but still not certain about how PBL would help me learn. [sic]" (37)

(*respondent continues*)

"PBL helped me to actually 'think' and research an issue to get a better understanding of it… Therefore, I think PBL developed my problem based skill greatly and I'm very thankful for that. I just feel PBL didn't increase my economic knowledge as much as I wanted to." (37)

Findings

- Evidence of
  - deep approach to learning
  - retention
  - Confidence
- Integrative experience

Recommendations

- At the margin, these proficiencies missing from traditional/modal pedagogies used in economics
- Part of disciplinary values
- Less grade outcomes based inference of value of instructional innovation

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